

ART 34 AMDT

The first aspect of the present invention is to provide a drug delivery system, which includes a tank member of biodegradable material having a chamber capable of sealing a medicament injected therein, and at least one anchor member of biodegradable material extending from the tank member. The anchor member is tapered toward a tip thereof, and has at least one protruding portion extending therefrom. Therefore, according to the drug delivery system, the sharp tip thereof facilitates easy penetration into the tissue. Also, forming with biodegradable material such as poly-lactic acid and providing the anchor member with the protruding portions allow the drug delivery system to be placed within a body portion where a flow of blood and/or lymph is rapid, providing no harm to the body. In addition, as poly-lactic acid is slowly dissolves, it gently release the medicament held in the tank member in small doses for a predetermined dosing period. This achieves a safer treatment with less burden for a patient instead of the conventional invasive surgery operation.

The second aspect of the present invention is to provide a drug delivery system, which includes a plurality of tank members of biodegradable material, and each of the tank members has a chamber capable of sealing a medicament injected therein. It also includes a connector member of biodegradable material connecting adjacent tank members, a

cap member arranged on the connector member for hermetically sealing each of the tank members, and at least one anchor member of biodegradable material extending from the tank member. The anchor member is tapered toward a tip

5 thereof, and has at least one protruding portion extending therefrom. Therefore, according to the drug delivery

system, the sharp tip thereof facilitates easy penetration into the tissue. Also, forming with biodegradable material

such as poly-lactic acid and providing the anchor member

10 with the protruding portions allow the drug delivery system to be placed within a body portion where a flow of blood and/or lymph is rapid, providing no harm to the body. In

addition, as poly-lactic acid is slowly dissolves, it gently release the medicament held in the tank member in

15 small doses for a predetermined dosing period. Furthermore, a plurality of tank members allows the same or different kind of medicaments to release at different timings.

The third aspect of the present invention is to provide a drug delivery system, which includes an anchor

20 member of biodegradable material having a chamber capable of sealing a medicament injected therein. The anchor

member is tapered toward a tip thereof, and has at least one protruding portion extending therefrom. Thus, the drug

delivery system can readily be penetrated into the tissue

25 and placed within the body portion having rapid flow of

blood or body fluid, thereby to gently release the medicament held therein in small doses for a predetermined dosing period.

5 The fourth aspect of the present invention is to provide a drug delivery system, which includes a tank member of biodegradable material containing a medicament therein, and at least one anchor member of biodegradable material extending from the tank member. The anchor member has a plurality of protruding portions combining a
10 plurality of quadrangular pyramids having sides different from one another. Thus, the drug delivery system can gently release the medicament contained in the biodegradable material such as poly-lactic acid in small doses.

15 The fifth aspect of the present invention is to provide a drug delivery system, which includes an anchor member of biodegradable material containing a medicament. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides
20 different from one another. Thus, the drug delivery system can gently release the medicament contained in the biodegradable material such as poly-lactic acid in small doses.

The sixth aspect of the present invention is to
25 provide a drug delivery system, which includes an anchor

member of biodegradable material having a tip tapered at one end in a longitudinal direction, and a mass of a medicament attached at the other end. The anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another. Thus, according to the drug delivery system, the mass of a medicament attached at the other end can be placed at the treatment portion.

The seventh aspect of the present invention is to provide a drug delivery system, which includes an anchor member of biodegradable material having a chamber capable of sealing a medicament injected therein. The anchor member has both ends tapered in a longitudinal direction, and has at least one protruding portion extending therefrom. Thus, the drug delivery system can gently release the medicament stored in the chamber in small doses for a predetermined dosing period.

Preferably, the protruding portion of the anchor member has a plurality of protruding portions combining a plurality of quadrangular pyramids having sides different from one another. The protruding portions can easily be formed, for example by wet etching the silicon substrate with potassium hydroxide.

Preferably, the protruding portion extends towards a direction inclined to a longitudinal direction

towards the tip at an obtuse angle. The protruding portion can easily be formed, for example by ion-reactive etching with sulfur hexafluoride.

Also, it is preferable that the biodegradable
5 material includes poly-lactic acid, glue, starch, protein, or glucose.

Preferably, the anchor member has a channel in fluid communication with the chamber of the tank member.

Also, the drug delivery system further includes a
10 plurality of the anchor members extending from the tank member towards different directions.

Also, the drug delivery system further includes a plurality of the anchor members extending from the tank member towards same directions.

15 Preferably, the tip of the anchor member is tapered as viewing in top plan and cross sectional views.

The eighth aspect of the present invention is to provide manufacturing process of a drug delivery system, which includes forming semiconductor oxide layers on first
20 and second semiconductor substrates, etching the semiconductor oxide layer on the first semiconductor substrate in a tank region and a plurality of circle regions discretely arranged so as to form a mask of the semiconductor oxide layer, wet etching the first
25 semiconductor substrate with use of the mask of the